



Generate Collection

L11: Entry 1 of 6

File: USPT

Aug 22, 2000

DOCUMENT-IDENTIFIER: US 6107538 A

TITLE: Absorbent members for absorbing body liquids

Detailed Description Paragraph Right (64):

"Foam density" (i.e., in grams of foam per cubic centimeter of foam volume in air) is specified herein on a dry basis. The amount of absorbed water-soluble residual materials, e.g., residual salts and liquid left in the form, for example, after HIPE polymerization, washing and/or hydrophilization, is disregarded in calculating and expressing foam density. Foam density does include, however, other water-insoluble residual materials such as emulsifiers present in the polymerized foam. Such residual materials can, in fact, contribute significant mass to the foam material.

Detailed Description Paragraph Right (84):

The hydrogel-forming polymer component may also be in the form of a mixed-bed ion-exchange composition comprising a cation-exchange hydrogel-forming absorbent polymer and an anion-exchange hydrogel-forming absorbent polymer. Such mixed-bed ion-exchange compositions are described in, e.g., U.S. patent application Ser. No. 09/003,565, filed Jan. 7, 1998 by Hird, et al. (P&G Case 6975--titled "ABSORBENT POLYMER COMPOSITIONS HAVING HIGH SORPTION CAPACITIES UNDER AN APPLIED PRESSURE"); U.S. patent application Ser. No. 09/003,905, filed Jan. 7, 1998 by Ashraf, et al. (P&G Case 6976--titled "ABSORBENT POLYMER COMPOSITIONS WITH HIGH SORPTION CAPACITY AND HIGH FLUID PERMEABILITY UNDER AN APPLIED PRESSURE"); and U.S. patent application Ser. No. 09/00,918, filed Jan. 7, 1998 by Ashraf, et al. (P&G Case 6977--titled "ABSORBENT POLYMER COMPOSITIONS HAVING HIGH SORPTION CAPACITIES UNDER AN APPLIED PRESSURE AND IMPROVED INTEGRITY IN THE SWOLLEN STATE"); the disclosure of each of which is incorporated herein by reference.

Detailed Description Paragraph Right (128):

Other materials generally known in the art may be included in the absorbent storage members, provided they are included at levels sufficiently low so the requisite capillary suction properties are achieved. Optional materials that may also be included in the storage members of the present invention include fibrous materials commonly combined with hydrogel-forming absorbent polymers. For example, wood-based fibers can be included, as can synthetic fibers. However, because such materials will tend to reduce the capillary suction capacity of the storage members comprising the high surface area material and the hydrogel-forming polymer, they will be included at relatively low levels, such that the members still provide the desired capillary suction absorbent capacity. Indeed, it may be preferred to exclude the use of such fibers, insofar as they add bulk and reduce capillary sorption capacity on a weight basis.

Detailed Description Paragraph Right (136):

An alternate process for mixing and acceleration of the particulate polymeric foam and hydrogel-forming polymer utilizes electrostatic forces. In this embodiment, the two types of materials are "charged" to cause an attractive force between them. This force is used to create the homogeneous blend of the two, and potentially will create the motive force to accelerate the blend through the adhesive stream, thus eliminating one of the process air streams.

Detailed Description Paragraph Right (143):

In addition to the storage absorbent member of the present invention, the absorbent core of the absorbent articles herein can also comprise other, e.g., conventional, elements or materials. In one embodiment involving a combination of the absorbent member herein and other absorbent materials, the absorbent articles can employ a multi-layer absorbent core configuration where a core layer containing one or more absorbent storage members of the present invention can be used in combination with one

or more additional separate core layers comprising other absorbent structures or materials. These other absorbent structures or materials, for example, can include air-laid or wet-laid webs of wood pulp or other cellulosic fibers. These other absorbent structures can also comprise foams, e.g., absorbent foams or even sponges useful as liquid acquisition/distribution components such as those disclosed in U.S. Pat. No. 5,563,179 (Stone et al.) issued Oct. 8, 1996, the disclosure of which is incorporated herein by reference.

Detailed Description Paragraph Right (169):

The bottom of glass frit 202 is connected to Tygon.RTM. tubing 203 that connects the frit 202 to three-way drain stopcock 209. Drain stopcock 209 is connected to liquid reservoir 205 via glass tubing 204 and stopcock 210. (The stopcock 209 is open to the rain only during cleaning of the apparatus or air bubble removal.) Glass tubing 211 connects fluid reservoir 205 with balance fluid reservoir 206. via stopcock 210. Balance liquid reservoir 206 consists of a light weight 12 cm diameter glass dish 206A and cover 206B. The cover 206B has a hole through which glass tubing 211 contacts the liquid in the reservoir 206. The glass tubing 211 must not contact the cover 206B or an unstable balance reading will result and the test sample measurement cannot be used.

Detailed Description Paragraph Right (170):

The glass frit diameter must be sufficient to accommodate the piston/cylinder apparatus, discussed below, for holding the test sample. The glass frit 202 is jacketed to allow for a constant temperature control from a heating bath. The frit is a 350 mL fritted disc funnel specified as having 4 to 5.5 μm pores, available from Corning Glass Co. (Corning, N.Y.) as #36060-350F. The pores are fine enough to keep the frit surface wetted at capillary suction heights specified (the glass frit does not allow air to enter the continuous column of test liquid below the glass frit).

Detailed Description Paragraph Right (176):

A non-surfactant treated or incorporated apertured film (14 cm.times.14 cm) (not shown) is used to cover the glass frit 202 during Capillary Sorption experiments to minimize air destabilization around the sample. Apertures are large enough to prevent condensation from forming on the underside of the film during the experiment.

Detailed Description Paragraph Right (202):

This example describes a high capillary suction absorbent member comprising hydrogel-forming absorbent polymer and high surface area glass micro fibers as formed using a wet end forming process for increased density and structural organization over conventional air deposition processes. In order to construct such a hydrogel-forming absorbent polymer containing member which approaches a homogeneous distribution of absorbent polymer in the glass micro fiber matrix, the following procedure is followed.

Detailed Description Paragraph Right (203):

A mixture of 4.0 g of ASAP 2300 (available from Chemdal LTD, a subsidiary of American Colloid Co., Arlington Heights, Ill.; also available from The Procter & Gamble Co., Paper Technology Division, Cincinnati, Ohio) and 4.0 g of glass micro fiber (available as "Q-FIBERS, Code 108, 110 Bulk" from Manville Sales Corp., Denver, Colo.) are combined in an explosion resistant 3-gallon Commercial grade Warner blender with approximately 500 mL of 3A alcohol (95% ethanol, 5% methanol), or Isopropanol, or similar liquids which will not degrade nor absorb into the structure or composition of the involved polymers. The mixture is stirred on low speed for approximately 5 min. The mixture is poured into a 6 in..times.6 in. "Paper Formation Box" with an 80 mesh Nylon Forming Wire (available from Appleton Mfg. Div., Productive Solutions, Inc., Neenah, Wis.) at the bottom of the upper portion of the Formation Box. Liquid level is brought to about 8 in. above the screen with addition of 3A alcohol, or appropriate solution. A paddle is used to mix the solution thoroughly in the top of the Formation box before liquid evacuation. A valve is opened below the forming wire and liquid is drained rapidly to ensure a uniform deposition on the forming wire. The screen is removed from the "Formation box", pulled across a vacuum source for removal of loosely held liquid, and allowed to air dry overnight in a desiccator containing a desiccant (such as DRIERITE, Sigme Chem. Co., St. Louis, Mo. 63178) to ensure uniform moisture content. Once dry, the absorbent member is removed from the forming screen.

Detailed Description Paragraph Right (211):

The combined mixing and recirculation apparatus set-up is filled with oil phase and water phase at a ratio of 4 parts water to 1 part oil. The dynamic mixing apparatus is vented to allow air to escape while filling the apparatus completely. The flow rates during filling are 7.57 g/sec oil phase and 30.3 cc/sec water phase.

Detailed Description Paragraph Right (217):

The foam remains compressed after the final nip at a thickness of about 0.021 in. (0.053 cm). The foam is then dried in air for about 16 hours. Such drying reduces the moisture content to about 9-17% by weight of polymerized material. At this point, the foam sheets are very drapeable and "thin-after-drying".

Detailed Description Paragraph Right (226):

The foam remains compressed after the final nip at a thickness of about 0.028 in. (0.071 cm). The foam is then dried in air for about 16 hours. Such drying reduces the moisture content to about 9-17% by weight of polymerized material. At this point, the foam sheets are very drapeable and "thin-after-drying".

Detailed Description Paragraph Right (235):

The foam remains compressed after the final nip at a thickness of about 0.028 in. (0.071 cm). The foam is then dried in air for about 16 hours. Such drying reduces the moisture content to about 9-17% by weight of polymerized material. At this point, the foam sheets are very drapeable and "thin-after-drying".

Detailed Description Paragraph Right (237):

10 g of air dried polymeric foam (prepared according to Example 3 above) is placed in a blender (Osterizer model 848-36L) equipped with a 1.25 liter jar, into which 1 liter of 2% calcium chloride solution has been placed. After ensuring that all of the foam material is submerged, the blender is agitated on the 'Liquify' (high setting) for 10 seconds and then additionally agitated on the 'Grate' setting for 5 sec. The resultant slurry is then transferred to a Buchner funnel (Coors USA model 60283) lined with a paper towel. Approximately 500 ml of fluid is freely drained from the sample. The sample is then covered with a rubber membrane and vacuum is applied (approximately 500 mm Hg) to dewater the sample to a weight of 50 to 60 grams.

Detailed Description Paragraph Right (238):

The aggregated sample is returned to a dry blender jar and dispersed with the agitation set on 'Liquify' while the jar and base are inverted and returned to upright several times to disperse the sample to approximately individual particles. The dispersed sample is then air dried under ambient conditions and then the foam particles are combined with hydrogel-forming absorbent polymer (ASAP 2300, available from Chemdal Corporation of Palantine, Ill.; also available from The Procter & Gamble Co., Paper Technology Division, Cincinnati, Ohio), to provide a storage absorbent member consisting of a homogeneous blend of 50%, by weight, hydrogel forming polymer and 50%, by weight, high surface area polymeric foam.

Detailed Description Paragraph Type 1 (10):

7. Attach the Tygon.RTM. tubing 203 to the level glass frit 202 and then open stopcock 209 and stopcock 210 leading from fluid reservoir 205 to the glass frit 202. (Stopcock 210 should be closed to glass tubing 211.) The test liquid fills the glass frit 202 and removes all trapped air during filling of the level glass frit. Continue to fill until the fluid level exceeds the top of the glass frit disc 260. Empty the funnel and remove all air bubbles in the tubing and inside the funnel. Air bubbles may be removed by inverting glass flit 202 and allowing air bubbles to rise and escape through the drain of stopcock 209. (Air bubbles typically collect on the bottom of the glass frit disc 260.) Relevel the frit using a small enough level that it will fit inside the jacketed funnel 250 and onto the surface of glass frit disc 260.



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L11: Entry 2 of 6

File: USPT

Jul 5, 1988

DOCUMENT-IDENTIFIER: US 4755178 A

TITLE: Sorbent sheet material

Brief Summary Paragraph Right (2):

A different product taught in U.S. Pat. No. 4,103,062 is made by dispersing particles in an air-laid cellulosic fiber web and densifying the web with heat and pressure to increase its strength. However, this product sorbs only a limited amount of liquid, because of the nonexpansible nature of the densified web, and because sorbent particles at the edge of the web swell upon initial liquid intake and prevent permeation of additional liquid into internal parts of the web. U.S. Pat. No. 4,105,033 seeks to avoid such edge blockage by distributing the sorbent particles in spaced layers separated by layers of fibers, but such a construction requires added processing steps and is subject to delamination. In other products sorbent particles are simply cascaded into a loose fibrous web (see U.S. Pat. No. 3,670,731), but both U.S. Pat. No. 4,103,062 and U.S. Pat. No. 4,105,033 note that it is difficult to deposit the particles uniformly, and the particles tend to move within the web during subsequent processing, storage, shipment or use of the web and thereby develop nonuniform properties.

Brief Summary Paragraph Right (7):

Large quantities of liquid can be sorbed at a rapid rate, with the amount dependent principally on the sorption capacity of the individual sorbent particles and the rate of sorption greatly enhanced by the transport fibers. Liquid is rapidly sorbed by sorbent particles located in even the inner parts of the sheet product, due to the sorbent particles being held apart by the web structure and the transport fibers conducting the liquid to particles located in the interior portion of the web. The melt blown fibers of the web are preferably wet by the liquid being sorbed, e.g., as a result of use of a fiber-forming material that is wet by the liquid or by addition of a surfactant during the web-forming process, which further assists sorption.

Detailed Description Paragraph Right (2):

This apparatus prepares webs with melt-blown fibers (prepared by extruding molten fiber-forming material and which are preferred in many webs of the invention), but solution-blown and other types of fibers may also be used. The fiber-blowing portion of the illustrated apparatus can be a conventional structure as taught, for example, in Wentz, Van A. "Superfine Thermoplastic Fibers", in Industrial Engineering Chemistry, Vol. 48, pages 1342 et seq (1956), or in Report No. 4364 of the Naval Research Laboratories, published May 25, 1954, entitled "Manufacture of Superfine Organic Fibers" by Wentz, Van A.; Boone, C. D.; and Fluharty, E. L. Such a structure includes a die 10 which has an extrusion chamber 11 through which liquified fiber-forming material is advanced; die orifices 12 arranged in line across the forward end of the die and through which the fiber-forming material is extruded; and cooperating gas orifices 13 through which a gas, typically heated air, is forced at very high velocity. The high-velocity gaseous stream draws out and attenuates the extruded fiber-forming material, whereupon the fiber-forming material solidifies as fibers during travel to a collector 14. The collector 14 is typically a finely perforated screen, which in this case is in the form of a closed-loop belt, but which can take alternative forms, such as a flat screen or a drum or cylinder. Gas-withdrawal apparatus may be positioned behind the screen to assist in deposition of fibers and removal of gas. Alternatively, two dies may be used and arranged so that the streams of melt blown fibers issuing from them intersect to form one stream that continues to a collector 14.

Detailed Description Paragraph Right (3):

The apparatus shown in FIG. 1 also includes means for introducing sorbent particles and staple transport fibers into the sheet product of the invention. The transport

fibers are introduced into the stream of melt blown fibers through the use of a lickerin roll 16. A web 17 of transport fibers, typically a loose, nonwoven web such as prepared on a garnet machine or "Rando-Webber", is supplied from a supply roll 18 under a drive roll 19 where the leading edge engages against the lickerin roll 16. The lickerin roll 16 turns in the direction of the arrow and picks the transport fibers from the leading edge of the web 17, dissociating the transport fibers from one another. The sorbent particles are supplied from a particulate hopper 20 through an inductor 21 which meters the amount of particles flowing into a venturi 22 which is in duct 23. An air stream flows through duct 23 for conveying the sorbent particles. The sorbent particles are conveyed to inclined duct 24 where the fluidized stream of sorbent particles becomes the carrier stream for the transport fibers delivered by the lickerin roll 16. The sorbent particles and transport fibers are conveyed in the air stream through inclined duct 24 and into the stream of melt blown fibers where the sorbent particles and transport fibers become mixed with the melt blown fibers. The mixed stream of melt blown fibers, transport fibers and sorbent particles then continues to the collector 14 where a web of randomly intermixed and intertangled microfibers 31, transport fibers 32, and sorbent particles 33, as shown in FIG. 2, is formed. A spray jet 25 may be used to apply materials, such as binders and wetting agents, to the mixed stream of blown fibers, sorbent particles and transport fibers prior to collection at collector 14.



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L11: Entry 4 of 6

File: USPT

Mar 17, 1987

DOCUMENT-IDENTIFIER: US 4650479 A

TITLE: Sorbent sheet product

Brief Summary Paragraph Right (10):

Large quantities of liquid can be sorbed at a rapid rate, with the amount dependent principally on the sorption capacity of the sorbent staple fibers and the quantity of sorbent staple fibers contained within the web. Liquid is rapidly sorbed by portions of the sorbent staple fibers located in even the inner parts of the web, due to the sorbent staple fibers being held apart by the web structure and the portions of the sorbent staple fibers located at the exterior of the web conducting the liquid to portions of the sorbent staple fibers located in the interior portion of the web. The melt blown fibers of the web are preferably wet by the liquid being sorbed, e.g., as a result of use of a fiber-forming material that is wet by the liquid or by addition of a surfactant during the web-forming process, which further assists sorption.

Detailed Description Paragraph Right (2):

This apparatus prepares webs with melt-blown fibers (prepared by extruding molten fiber-forming material and which are preferred in many webs of the invention), but solution-blown and other types of fibers may also be used. The fiber-blowing portion of the illustrated apparatus can be a conventional structure as taught, for example, in Wentz, Van A. "Superfine Thermoplastic Fibers", in Industrial Engineering Chemistry, Vol. 48, pages 1342 et seq (1956), or in Report No. 4364 of the Naval Research Laboratories, published May 25, 1954, entitled "Manufacture of Superfine Organic Fibers" by Wentz, Van A.; Boone, C. D.; and Fluharty, E. L. Such a structure includes a die 10 which has an extrusion chamber 11 through which liquified fiber-forming material is advanced; die orifices 12 arranged in line across the forward end of the die and through which the fiber-forming material is extruded; and cooperating gas orifices 13 through which a gas, typically heated air, is forced at very high velocity. The high-velocity gaseous stream draws out and attenuates the extruded fiber-forming material, whereupon the fiber-forming material solidifies as fibers during travel to a collector 14. The collector 14 is typically a finely perforated screen, which in this case is in the form of a closed-loop belt, but which can take alternative forms, such as a flat screen or a drum or cylinder. Gas-withdrawal apparatus may be positioned behind the screen to assist in deposition of fibers and removal of gas. Alternatively, two dies may be used and arranged so that the streams of melt blown fibers issuing from them intersect to form one stream that continues to a collector 14.

Detailed Description Paragraph Right (3):

The apparatus shown in FIG. 1 also includes means for introducing the sorbent staple fibers into the sheet product of the invention. The sorbent staple fibers are introduced into the stream of melt blown fibers through the use of a lickerin roll 16. A web 17 of sorbent staple fibers, typically a loose, nonwoven web such as prepared on a garnet machine or "Rando-Webber", is propelled along a table 18 under a drive roll 19 where the leading edge engages against the lickerin roll 16. The lickerin roll 16 turns in the direction of the arrow and picks the sorbent staple fibers from the leading edge of the web 17, dissociating the sorbent staple fibers from one another. The picked sorbent staple fibers are conveyed in an air stream to inclined duct 20 and into the stream of melt blown fibers where the sorbent staple fibers become mixed with the melt blown fibers. The air stream is generated inherently by rotation of the lickerin roll, or that air stream may be augmented by use of an auxilliary fan or blower operating through a duct 21 as is known in the art. The mixed stream of melt blown fibers and sorbent staple fibers then continues to the collector 14 where a web 22 of randomly intermixed and intertangled melt blown fibers and sorbent staple fibers is formed. A spray jet 25 may be used to apply materials, such as wetting agents, to the mixed stream of blown fibers and sorbent staple fibers prior to collection at

collector 14.

Detailed Description Paragraph Right (13):

A 4.45 cm (1.75 inch) in diameter test sample of sorbent sheet or, in the case where sorbent fibers are to be tested, an air-laid web of sorbent fibers prepared by using, for example, a "Rando Webber", is placed on a 25-50.mu. porous plate in a filter funnel. A pressure of 1.0 kPa is applied to the sample by a plunger which is freely movable in the barrel of the funnel. Test fluid at zero hydrostatic head is conducted from a reservoir through a siphon mechanism to the upper surface of the porous plate where the test sample sorbs the test fluid. The amount of test fluid withdrawn from the reservoir by the test sample is then measured to determine the amount of test fluid sorbed by the test sample.

Detailed Description Paragraph Right (29):

In Examples 6-10, sorbent sheet products were prepared as in Examples 1-5 with polypropylene microfibers, sorbent staple fibers and surfactant. Comparative Example 2 was prepared from polypropylene microfibers without the addition of sorbent staple fibers. Comparative Example 3 was prepared from air-laid sorbent staple fiber without the addition of microfibers using a "Rando-Webber". Demand sorbency tests were then conducted on each prepared sheet using synthetic urine. The results are shown in Table 2. Centrifugal retention tests were also conducted on the sheets of Examples 6-10 and Comparative Example 3 using synthetic urine. The results are shown in Table 3.

WEST

Generate Collection

L7: Entry 8 of 17

File: USPT

Jun 23, 1998

DOCUMENT-IDENTIFIER: US 5770012 A

TITLE: Process for treating paper machine stock containing bleached hardwood pulp with an enzyme mixture to reduce vessel element picking

BSPR:

There are two abstracts of a Japanese article that describe the use of a cellulase enzyme to reduce the vessel picking of pulp. The abstracts mention that the treatment was especially effective on eucalyptus, which is a hardwood. The pure cellulase enzyme used in the Japanese article is marketed under the name Vesselex. Vesselex is stated to be used for the suppression of vessel pick formation. The abstracted article is Ishizaki, H., Tappi J., 46, No. 1, (January 1992), pages 149 to 155.

BSPR:

The bleached pulp is best produced from the Kraft, Sulfite, or any other commercially feasible process and bleached to a minimum of 80 percent brightness. The hardwood pulp typically is oak, maple, poplar, birch, chestnut, aspen, beech, walnut or eucalyptus or mixtures thereof.

BSPR:

The hardwood pulp usually is a pulp of a species of oak, maple, poplar, birch, chestnut, aspen, beech, walnut, eucalyptus or mixtures thereof.

BSPR:

Vesselex is a liquid cellulase preparation standardized at 100 U/g FPase which is marketed by Solvay Biosciences Pty. Ltd., Victoria, Australia. When hardwood pulp (Eucalyptus) is used as the raw material for the manufacture of paper, the vessels which remain in the paper cannot properly accept the ink during printing, and the ink at the site of the vessels comes off causing the vessel pick phenomena. Solvay Biosciences asserts that Vesselex is a cellulase enzyme which has been specially developed to reduce the formation of vessel picks in paper manufactured from hardwood pulp. The process of using Vesselex in the paper industry uses pulp thickening and then, before bleaching, enzyme (from an enzyme holding tank at 5.degree. C.) added to white water which is fed to a static mixer and the mixture is then added to a pulp chest which is sent to a refinery. The stated conditions were: pulp concentration, 5 to 6 percent; pH, 5.0 to 5.5; enzyme dose, 0.02 to 0.03 percent (w/w); temperature, 30.degree. to 40.degree. C.; and reaction time, not less than 4 hours. Regarding the prevention of vessel pick formulation by Vesselex cellulase: at an enzyme dosage of zero percent (w/w), the vessel picks were 185 (count per 10 sq. cms.); at an enzyme dosage of 0.1 percent, the vessel picks were 18; and at an enzyme dosage of 0.2 percent, the vessel picks were 22. It is reported that, as the Vesselex cellulase dosage increases, the pulp degradation increases, but at the ideal dosage of 0.03 to 0.05 percent, there is almost no pulp loss. It is also reported that the Vesselex cellulase is completely inactivated in one minute under normal machine drying conditions at 120.degree. C.

CLPR:

6. The process as claimed in claim 1, wherein the pulp is a hardwood species selected from the group consisting of oak, maple, poplar, birch, chestnut, aspen, beech, walnut, eucalyptus and mixtures thereof.

CCXR:

435/277

CCXR: